582.29

Parmelia subaurifera Nyl. and P. fraudans (Nyl.) Nyl. in Greenland

By PAUL GELTING

PUBLICATIONS FROM
THE DANISH ARCTIC STATION
ON DISKO ISLAND, GREENLAND

Nr. 18

JUL 8 1961

LIBRARY
BOREAL INSTITUTE

Særtryk af FRIESIA V, 3-5: 240-246 — 1956.
København

POLAR
PAM
2948

POLARPAM

Pam:582.29:(*38)GEL

Særtryk af FRIESIA V, 3-5: 240-246 — 1956.

PARMELIA SUBAURIFERA Nyl. AND P. FRAUDANS (Nyl.) Nyl. IN GREENLAND

By PAUL GELTING

An auto trip on the sea ice along the S. coast of Disko Isl., W. Greenland, gave me on February 23, 1950 the opportunity of studying the lichens at Engelskmandens Havn. For the vegetation at the stenothermous springs here, keeping a temperature of ca. + 17° C, see Porsild (Medd. om Grønl. 25, 1902, 181, & ibid. 60, 1921, 313).

On the day of my visit the air temperature was ca. ÷ 25° C, and the main stream of the springs ran unhampered into the sea. The easternmost spring, which in summer irrigates a meadowy stand of *Juncus arcticus* rich in *Habenaria hyperborea,* was frozen. Consequently I could lay down with my back on the frozen spring and study the lichens growing on the lower side of the large gneiss blocks forming almost a cave over the spring.

The roof of the cave was partially covered by rime and ice, evidently formed when the spring was still flowing. In the crust of sterile and leprarioid lichens I could determine: *Cetraria hepatizon, Parmelia saxatilis, P. subaurifera, Peltigera scutata* and *Physcia grisea.* On the top of the blocks outside the cave grew: *Cetraria commixta, Parmelia disjuncta, P. fraudans* and *P. sulcata.*

In the following some data are given about *Parmelia subaurifera* and *P. fraudans,* the first never, the second rarely recorded from the Arctic. Microtome sections studied, 5 and 10μ thick. Field numbers are cited in paranthesis after the collecting places.

The material was partly worked up at the Arctic Station, Godhavn, W. Greenland, partly at the Institute of Systematic Botany of the University of Uppsala (UPS). To Professor J. A. Nannfeldt and his staff, especially Docent Rolf Santesson, I express my cordial thanks. Fil. lic. T. E. Hasselrot, curator at the Riksmuseum, Stockholm (S), has kindly confirmed my determinations of *Parmelia fraudans.*

BOREAL INSTITUTE
LIBRARY
45061

1. Parmelia subaurifera Nyl.

in Flora, 56, 1873, 22. ZAHLBRUCKNER, Catal. 6, 1930, 117. TAVARES 1945, 78. MAAS GEESTERANUS 1947, 126.

Icon.: GALLØE 1948, Pl. 35 & 36, figs. 230—247.

Exs.: CLAUD. 121; ELENK. 153; FLAG. Fr. C. 110; Krypt. Vind. 1872; MALME 135; NORRL. 31; OLIV. 12; ROUM. 405; ZW. 525, 865; KRAWIEC 82; SUZA 145. All seen in UPS.

W. Greenland: Godhavn, Engelskmandens Havn, cave (cf. p. 241), 3—4 m. s. m. (10689, 12709).

Specimens 1—2 cm in diam., upper surface yellowish brown. Isidial soredia numerous, typical; as young yellowish, in age whitening. Lower surface black to brown, rhizinose.—Apothecia absent.

Thallus 90—160 μ thick. Upper cortex 6—10 μ thick, brown, formed of one layer of firmly coherent cells (as in GALLØE l. c., fig. 242). Medulla up to 120 μ thick, white, forming an open tissue, C + red. Hyphae 4—6(9) μ, membrane 1 μ thick, at intervals covered by white granules, giving the hyphae a woolly appearance (as in GALLØE, fig. 246). Lower cortex 6—8 μ thick, brown, formed of one cell-layer (as in GALLØE, fig. 243). Algae globoid, 8—14 μ, light green, cystococcoid, forming a thin, ± open layer below upper cortex. Description after 12709.

The specimens recall N. Fennoscandian ones and may be referred to the main species (cf. MAAS GEESTERANUS l. c.).

Habitat: The lichen crust, in which *Parmelia subaurifera* takes part, is slightly dusty. The presence of *Physcia grisea* (interwoven with *P. subaurifera)* indicates the dust to be rich in nutritive matter. The dust may originate from droppings of the snow-buntings visiting the cave, or from the disintegrating "tufa" layers surrounding the gneiss area at Engelskmandens Havn.

The spring breaks early and freezes late. It ameliorates in several respects the summer climate of the cave in diminishing the temperature oscillations and augmenting the aerial humidity.

The roof of the cave receives light reflected from the snow outside, which persists for a long time after the spring has broken through. It also receives light reflected from the spring itself running the whole vegetation period. Light reflected from the snow is of great importance in the Arctic and of particular influence in spots not reached by the sun. This may illustrate how *P. subaurifera* and other species can sustain life in a cave never receiving direct sunlight. The locality is far N. of the previously known distribution of the species and represents so far the sole known Arctic record. Within its main area in more southern climes, *P. subaurifera* is mostly an epiphyte of trees.

Geographical distrib.: Greenland (cf. p. 242). — Europe: From Finnmark, Swedish, Finnish and Russian Lapponia through all European countries to the Mediterranean (Spain, Italy, Dalmatia, Greece). Crimea: Jalta, leg. DEGELIUS (Herb.); Caucasus. From Ural: Molotov (Perm), pr. pag. Oborino, leg. A. OXNER (UPS), to Scotland and the islands W. hereof: Isl. of Mull, leg. P. O. LINDAHL (UPS). Ireland; Bretagne; Portugal. In S. E. Europe mainly montane. — N. Africa: Morocco; Algeria. — Asia: Middle Ural; Konda; Minusinsk. At the Ob: Kalinsk, 61° N. lat., leg. M. BRENNER (S); at the Yenisej: Yenisejsk, Stolba and Uskij mys, 61° 27' N. lat., leg. M. BRENNER (S). China: Kansu, Tsagaling, on *Picea* and *Betula,* 1900—2200 m. s. m., leg. D. HUMMEL (S). — N. America: U. S. A.: Maine, Mt. Desert Isl., leg. G. LLANO (UPS); Connecticut; New York; Tennessee; Michigan; Wisconsin: Lincoln co., leg. J. W. THOMSON (2438, UPS); Minnesota. Canada: Nova Scotia, Cape Breton Isl.; Ontario: Bear Isl., leg. R. F. CAIN (21738, UPS); British Columbia: Vancouver Isl., leg. J. MACOUN (UPS). — I have seen no records from Asia Minor, E. Asia and western U. S. A.

2. Parmelia fraudans (NYL.) NYL.

in NORRLIN, Not. Sällsk. F. Fl. Fenn. Förh. 13, 1871, 324; ZAHLBRUCKNER, Catal. 6, 1930, 166; LYNGE 1921, 171; HASSELROT 1953, 80. — *P. saxatilis* **P. fraudans* NYL., Lich. Scand. 1861, 100 & Lich. Lapp. Orient. 1866, 119.

Icon.: Fig. 1, p. 244.

Exs.: HAV. 557; Krypt Vind. 1970; MALME 556; NORRL. 25; RÄS. 45, 46.

W. Greenland: Upernivik: Pâ. Disko: Diskofjord, basalt block at trading post; Godhavn, Engelskmandens Havn, gneiss block 4—5 m. s. m. (10688); Lyngmarken, gneiss block in *Salix* copse, 20 m. s. m. (12719, 18573a). Egedesminde: Arfersiorfik Fjord: Serfartok Isl., low gneiss block in *Betula nana* heath, 15 m. s. m. (16538); Agpakarfik, N. exp. gneiss rocks with *Lobaria scrobiculata,* 30 m. s. m. (16236a-b); Ordlerfik, low gneiss blocks near bird place, 8 m. s. m. (16061b). All collected by GELTING. The first find of this species in Greenland was made by M. SKYTTE CHRISTIANSEN in 1946 at Holsteinsborg: Head of S. Strømfjord (kind verbal communication).

Specimens up to 8 cm, occasionally 12 cm in diameter. Upper surface darker or lighter greyish, often with a yellow tinge. Soredia typical, frequently elevated on an isidioid base; as young limbiform (DU RIETZ 1924, 379), in age ± confluent (Fig. 1, p. 244). Lower surface black to brown, rhizinose. — Apothecia absent.

Thallus 150—260 μ thick; upper surface covered by a 4—5 μ thick, uncoloured, necral stratum. Upper cortex 20—36 μ thick, paraplectenchymatous, uncoloured or greyish; at middle enlargements seemingly divided in an upper darker and a lower lighter stratum. Cortical cells 4—6 in number, membrane not particularly thick. Medulla 40—150 μ thick, whitish, forming an open tissue, C—, K+ yellow-red; hyphae 2—3(4) μ thick, leptodermatic; membrane 0.5—0.8 μ thick. Lower cortex 8—30 μ thick, paraplectenchymatous, brown; cells 3—4(5) in number, mesodermatic. In the apices of the lobes a brownish stratum with ± coherent cells is found between lower cortex and medulla. It is found also in the interior of the rhizinae. Algae globoid, 6—15 μ in diam., cystococcoid, forming a layer, 30—90 μ thick, below upper cortex. Description after 18573a.

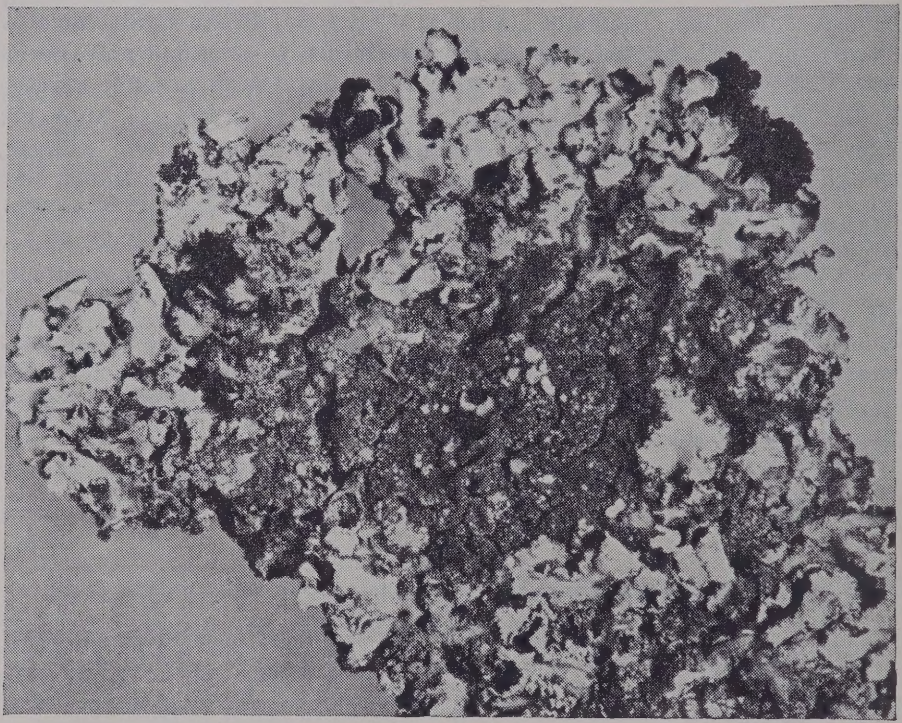

Fig. 1. *Parmelia fraudans* (NYL.) NYL. Specimen from Agpakarfik (16236 a). SVEN ERIKSSON (Växtbiol. Inst.) phot. ×2.

NYLANDER (Flora 52, 1869, 292) doubted the value of his subspecies, but raised it to a specific rank 1871. *Parmelia fraudans* deviates from *P. saxatilis* in bearing soredia, from *P. sulcata* in the form and arrangement of the soredia. The Greenland specimens belong to the main species.

Parasites: *P. fraudans* is often overgrown by dark hyphae. In 18573a from Lyngmarken the hyphae bear spinulose apothecia belonging to *Echinothecium reticulatum* ZOPF.

Habitat: In the interior of Upernivik and Egedesminde districts *P. fraudans* is mainly found in the vicinity of bird places (eiderducks, ptarmigans, snow-buntings), however, not on the more intensely dunged rocks. At Ordlerfik the larger stones visited by ptarmigans were inhabited by: *Physcia dubia, Umbilicaria decussata, Xanthoria candelaria, Lecanora rubina, Rinodina cacuminum, R. oreina* a. o., while *P. fraudans* was not found. In the vicinity, however, it occurred abundantly on low stones together with ± mesotrophic species as: *Alectoria pubescens, Cetraria hepatizon, P. saxatilis* a. o.. On a block slightly influenced by snow-buntings it occurred at Lyngmarken together with: *Parmelia disjuncta, P. saxatilis, P. intestiniformis, Sphaerophorus globosus, Umbilicaria hyperborea, Crocynia neglecta, Lecanora polytropa* and *Rhizocarpon geminatum;* in the main a mesotrophic to slightly eutrophic community. In Fennoscandia *P. fraudans* is (HASSELROT, 1953, 82) in some degree favoured by human agency and becomes especially towards S. an apophyte.

As in Fennoscandia, *Parmelia fraudans* is also in Greenland most frequent in the inland. Godhavn and Diskofjord are the localities, where the species occurs nearest the open sea.

Geographical distrib.: Greenland, W. coast 66°—73° N. lat. — Europe: Mainly Fennoscandian. From Finnmark, Swedish, Finnish and Russian Lapponia S. to Oslo, Småland, Gulf of Finland, Karelian Isthmus, Leningrad, Ladoga- and Olonetz Karelia. Recorded from Novaya Zemlya, Tallin and Tartu. Caucasus. — N. America: Miquelon. Canada: Keewatin, Repulse Bay. Alaska: N. coast, Camden Bay.

In addition an unlocalized record (ECKFELDT 1895, 243) from Labrador or from New Foundland.

RESUMÉ

Parmelia subaurifera rapporteres for første gang fra Grønland, hvor den er fundet i en grotte ved de „varme“ kilder i Engelskmandens Havn ved Godhavn. *Parmelia fraudans* angives fra adskillige

steder paa vestkysten indtil 73⁰ n. br. Hos begge arter beskrives thallus-bygningen (apothecier fandtes ikke), ligesom der gives oplysninger om voksestedsbetingelser og geografisk udbredelse. Som parasit paa *P. fraudans* optræder i Godhavn *Echinothecium reticulatum,* der ikke tidligere er angivet fra Grønland.

LITERATURE

Ahlner, S.: Flechten aus Nordfinnland. — Ann. Bot. Soc. Zool. Bot. Fenn. Vanamo, 9, 1. Helsinki 1937.

Arnold, F.: Lichenologische Fragmente, 29, Miquelon. — Flora 71. Regensburg 1888.

Burnham, S. H.: Lichens of Lake George. — Bryologist 25. Pittsburgh 1922.

Degelius, G.: Contributions to the Lichen Flora of N. America I-II. — Ark. f. Bot. 30 A, 1 & 3. Uppsala 1940—41.

Dubrovsky, G. I.: Notulae ad floram lichenum reservati "Stolby" regionis Krasnojarsk. — Not. Syst. Crypt. Inst. Bot. Komarovii. Acad. Scient. URSS. 9. Moskva 1953.

Du Rietz, G. E.: Die Soredien und Isidien der Flechten. — Sv. Bot. Tidskr. 18. Uppsala 1924.

Eckfeldt, J. W.: An Enumeration of the Lichens of New Foundland and Labrador. — Bull. Torrey Bot. Club. 22, 6. Lancaster, Pa. 1895.

Evans, A. W. & Meyrowitz, R.: Catalogue of the Lichens of Connecticut. — Conn. State Geol. Nat. Hist. Surv. Bull. 37. Hartford 1926.

Flagey, C.: Catalogue des Lichenes. — Battandier & Trabut: Flore de l'Algérie, 2. Alger 1896—1897.

Galløe, O.: Natural History of the Danish Lichens. 7. Copenhagen 1948.

Gattefossé, J. & Werner, R. G.: Catalogus Lichenum Marocanum. — Bull. Soc. Sci. Nat. Maroc. 11. Rochefort-sur-mer 1931.

Hasselrot, T. E.: Nordliga lavar i Syd- och Mellansverige. — Act. Phytogeogr. Suecica 33. Uppsala 1953.

Lamb, I. M.: Lichens of Cape Breton Island, Nova Scotia. — Ann. Rept. Nat. Mus. Canada 1952—53, Bull. 132. Ottawa 1954.

Lynge, B.: Studies on the Lichen Flora of Norway. — Vid. Selsk. Skr. I. Mat. Nat. Kl. 1921, 7. Kristiania 1921.

— : Lichens from Novaya Zemlya. — Rep. Norw. Exp. N. Z. 1921, 43. Oslo 1928.

— : A contribution to the Lichen Flora of Canadian Arctic. — Publ. Catholic Univ. America, Washington, D.C. 1939.

Maas Geesteranus, R. A.: Revision of the Lichens of the Netherlands. I. Parmeliaceae. Leiden 1947 (Diss.).

Magnusson, A. H.: Lichens from Torne Lappmark. — Ark. f. Bot. 2, 2. Uppsala 1952.

Merrill, G. K.: Lichens Collected by the Canadian Arctic Exp. 1913—18. — Rep. Can. Arct. Exp. 1913—18, 4. Ottawa 1924.

Nichols, G.: Lichens of Douglas Lake. — Bryologist 28. Pittsburgh 1925.

Räsänen, V.: Die Flechten Estlands I. — Ann. Acad. Sci. Fenn., Ser. A. 34, 4. Helsinki 1931.

Tavares, C. N.: Contribuïção para o Estudo das Parmeliáceas Portuguesas. — Portug. Acta Biol., Sér. B, I. Lisboa 1945 (Diss.).

Thomson, J. W.: Lichens from the Keweenaw Peninsula. — Bryologist 54. Pittsburgh 1951.

Vainio, E.: Lichenes in Sibiria meridionali collecti. — Act. Soc. F. Fl. Fenn. 13. Kuopio 1896.

— : Lichenes in Caucaso et in peninsula Taurica ab H. Lojka et M. a. Déchy collecti. — Természetrajzi Füzetek, 22. Budapest 1899.

— : Enumeratio Lichenum in viciniis fluminis Konda in Sibiria occidentali crescentium. — Ann. Acad. Sci. Fenn., Ser. A. 27. Helsinki 1928.

Zopf, W.: Untersuchungen über die durch Pilze hervorgerufenen Krankheiten der Flechten. — Nov. Act. Acad. Leopold. Carol. Germ. Nat. Cur. 70. Halle 1898.

Uppsala, February 1956.

Date Due

45061 Pam:582.29:(*38)
GEL

GELTING, Paul

AUTHOR

Parmelia subaurifera Nyl and P. fraudans (Nyl.)Nyl. in Greenland.

TITLE

DATE

45061

BOREAL INSTITUTE
LIBRARY

University of Alberta Library
0 1620 0333 7456

HERTZ - BOGTRYKKERGAARDEN, KØBENHAVN